

REMARKS

The application has been amended and is believed to be in condition for allowance.

The Official Action objected to drawing Figure 1 for not including a prior art legend. Responsively, drawing Figure 1 has been amended to include a prior art legend.

The specification has been amended as directed by the Official Action.

The Official Action objected to certain of the previously pending claims. The Official Action rejected the previously pending claims under §112, second paragraph, as being indefinite.

The claims have been amended so as to remedy the stated basis of objection and rejection. Accordingly, withdrawal of both the objection and rejection is solicited.

Claims 1-20 were rejected as obvious over applicants' admitted prior art (Figure 2, "AAPA") in view of GHERA et al. 6,433,922.

Note that certain dependent claims have been canceled and that amended claim 1 includes recitations that more specifically define the inventive controlling means.

The present invention relates to a method and apparatus for amplifying light signal. The Raman amplifying apparatus of the present invention is equipped with an OTDR device 110 that

measures a power of the back-scattered light returned from a transmission line 112. The back-scattered light is the light excited by excitation light outputted from excitation light source 140 wherein the power of the excitation light is controlled by a control circuit 200, making the ratio of the power of two back-scattered lights constant at a certain section (B END in Fig. 5 or B'POINT in Fig. 7) of the transmission line 112.

As mentioned above, in the present invention, the excitation light is controlled to make the ratio of the power of the first back-scattered light to the power of the second back-scattered light constant at a point (B'POINT in Fig. 7) of the transmission line 112.

Therefore, even if the back-scattered light from the end (B END in Fig. 5) of the transmission line 112 cannot be detected due to noise, a Raman gain generated in the entire transmission line can be obtained by only detecting a propagation loss concerning the point (B'POINT in Fig. 7).

#### AAPA

AAPA discloses an apparatus for measuring a power of a light emitted from a transmission line 112. The emitted light is excited by an excitation light outputted from an excitation light source 140. However, AAPA merely discloses measuring a power of the light and does not disclose measuring a power of a back-

scattered light. Moreover, AAPA never discloses controlling the power of the excitation light.

GHERA

GHERA discloses an apparatus for adjusting Raman amplifier which measures the back-scattered Stimulated Raman scattering of a pump at one or more power levels. The pump levels are adjusted to achieve optimal Raman gain and gain equalization. GHERA never discloses, however, how the power of the excitation light is controlled. Therefore, GHERA does not disclose a controlling means of the present invention, which controls the power of the excitation light so as to make the ratio of the power of two back-scattered lights constant at a certain section of the optical fiber.

With respect to the controlling means, the Official Action indicated that it would have been an obvious design choice to control the power of the excitation light as claimed to use the apparatus in different environment. However, the finding of an obvious design choice is to be precluded when the claimed structure and the function it performs are different from the prior art (See *In re Gal*, 980 F.2d 717 Fed. Cir. 1992).

According to the MPEP, furthermore, the *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by prior art (see MPEP 2143.03). As

explained above, on the other hand, the controlling means of the present invention is not taught or suggested by AAPA or GHERA. Especially, GHERA never also discloses the function the controlling means performs, which can detect a Raman gain generated in the entire transmission line by only detecting a propagation loss concerning a certain point. Therefore, the controlling means characterized in the present invention would have never been an obvious design choice and the claimed invention is believed non-obvious.

In view of the above, applicant believes that the present application is in condition for allowance and an early indication of the same is respectfully requested.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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REL/mjr  
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**APPENDIX:**

The Appendix includes the following item(s):

- a Replacement Sheet for Figure 1 of the drawings

AMENDMENTS TO THE DRAWINGS:

The attached sheet of drawings include changes to Figure 1. This sheet, which includes Figure 1, replaces the original sheet including Figure 1.

Figure 1 has been amended to add a PRIOR ART legend.

Attachment: One Replacement Sheet